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EXAMINER

WANG, QUAN ZHEN

| ART UNIT | PAPER NUMBER |
|----------|--------------|
| 2633 | |

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/002,857

Applicant(s)

CHANG ET AL.

Examiner

Quan-Zhen Wang

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 10-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 10-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This Office Action is a response to the amendment filed on 8/24/2005.

Response to Amendment

1. The amendment filed 8/24/05 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The newly added three paragraphs in the specification: "In accordance with one aspect of the present application, there is provided a optical network comprising: one or more than one photonic cells, each of said photonic cells comprising: a base node and a plurality of member nodes, each member node within optical reach of said base node; optical paths; said optical paths being established based on information of said photonic cells.

In accordance with another aspect of the present application, there is provided a method for determining an optical path through a network, comprising the steps of: a) defining a photonic cell of said base node; said photonic cell of said base node comprising nodes within an optical reach of said base node in the network; and b) routing said optical path based on information of said photonic cell.

In accordance with yet another aspect of the present application, there is provided computer readable medium storing instructions or statements for use in the

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execution in a computer of a method for determining an optical path through a network, the method comprising steps of: a) defining a photonic cell of said base node; said photonic cell of said base node comprising nodes within an optical reach of said base node in the network; and b) routing said optical path based on information of said photonic cell.” Nowhere does the specification teach the newly added paragraphs. Therefore, the new limitation is considered new matter.

Applicant is required to cancel the new matter in the reply to this Office Action.

Specification

2. The disclosure is objected to because of the following informalities: page 6, line 18, “...in row 50 indicates. That a signal ...” should read “...in row 50 indicates that a signal ...”.

3. Claim 2 is objected to because of the following informalities: “.. is predv betetermined ..” in line 2 should read “... is predetermined ...”.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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5. Claims 1-29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1 adds new limitations "An optical network comprising: one or more than one photonic cells, ... optical paths; said optical paths being established based on information of said photonic cells." The specification, as originally filed, teaches on page 5, lines 10-11: "every node (32, 34, 36, 38, 40, 42, 44, 46) is the base node for its own photonic cell"; on page 6, lines 13-26: "a survey of the cell members of each node on the route, one can easily devise a sequence of OEO sites as shown in FIG. 7b. A table is established with the firm now listing the nodes on the proposed route. The column under each node lists the cell members for that node. These members are given a common row orderly. Then the rows are shaded to indicate optical reach. For this example node 6 is the furthest from node 1 so shading in row 50 indicates. That a signal can reach from node 1 to node 6 photonicly and that node 6 is the node at which regeneration of the optical signal must occur. Since node 9 is the only node that can be reached from node 6 (in the forward direction), node 9 is the next OEO regeneration node as indicated by the shading in row 52. From node 9 both node 12 and node 17 can be reached as indicated by shading in rows 54 and 56, respectively. Hence the further node, node 17 is used. Finally from node 17, node 15, the distribution can be reached, as indicated by the shading of row 56. FIG. 7c shows the resulting optical path

in a block diagram.” Nowhere does the specification teach the newly added limitation. Therefore, the new limitation is considered new matter. For the same reason, the newly added claims 10 and 20 are considered new matter.

Claims 3 adds new limitations “... said base node is determined by input parameters selected from a group comprising of: optical route distance; fiber type; hut spacing; amplifier gain; transmitter budget; receiver budget; photonic cross-connect attenuation; photonic cross-connect hop count; polarization mode dispersion; Raman amplifier characteristics; dispersion compensation module characteristics; and combination thereof.” The specification, as originally filed, only lists in fig. 3 optical route distance; fiber type; hut spacing; amplifier gain; transmitter budget; receiver budget; photonic cross-connect attenuation; photonic cross-connect hop count; polarization mode dispersion; Raman amplifier. The specification, as originally filed does not teach to determine the optical reach “by input parameters selected from” the listed group. Therefore, the new limitation is considered new matter. For the same reason, the newly added claims 12 and 22 are considered new matter.

Newly added claim 15 recites “the method as claimed in claim 10, further comprising the step of selecting said route through an electrical cross-connect of a second node in said network, said second node having both electrical cross-connect and photonic cross-connect.” The specification, as originally filed, teaches on page 5, lines 25 to page 6 lines 5: “the basic application of the photonic cells in routing is depicted in FIGS. 6a and 6b. FIG. 6a, graphically illustrates a path through optical network nodes m, n and p. FIG. 6b illustrates in a block diagram a signal path through

optical network nodes m, n, and p. Regardless of routing objectives and implementations, there will come a time when one needs to know whether a potential next hop (for example from node n to node p) can be reached without OEO regeneration at node n.” and fig. 1 illustrates two forms of next generation optical switches. Nowhere does the specification teach the newly added claim. Therefore, claim 15 is considered new matter. For the same reason, the newly added claim 25 is considered new matter.

Newly added claim 16 recites “the method as claimed in claim 10, further comprising the step of forming a membership list of photonic cells based on the optical route.” The specification, as originally filed, teaches on page 7, lines 1-6: “Referring to FIG. 8, there is graphically illustrated another application of photonic cells to routes. As integral part of routing, OEO regeneration becomes one of the routing constraints. Hence a routing algorithm may determine three possible next hops, for example nodes p, q, and r in FIG. 8. The selection of next hop would depend on whether OEO was required. Through photonic cells membership lists, this information can be determined quickly.” Nowhere does the specification teach the newly added claim, namely, “forming a membership list of photonic cells based on the optical route”. Therefore, claim 16 is considered new matter. For the same reason, the newly added claims 17, 26, and 27 are considered new matter.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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7. Claims 1-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation: "An optical network comprising: one or more than one photonic cell, ... optical paths; said optical paths being established based on information of said photonic cells." However, it is not clear what are the "optical paths", and what the "information" of the photonic cells refers to.

Claim 10 recites the limitation: "...a) defining a photonic cell of a base node; said photonic cell of said base node comprising nodes within an optical reach of said base node in the network; and b) routing said optical path based on information of said photonic cell." However, it is not clear what is means by "defining a photonic cell of a base node", and it is not clear how to route an "optical path". An optical signal can be routed to go through different "path", but a "path" cannot be routed.

Claim 16 recites the limitation "the optical route" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 17 recites "identifying a previous optical-to-electrical conversion node in said membership list". However, it is not clear what "a previous optical-to-electrical conversion node" means.

Claim 20 recites the limitation: "defining a photonic cell of a base node; said photonic cell of said base node comprising nodes within an optical reach of said base node in the network; and b) routing said optical path based on information of said photonic cell." However, it is not clear what "determine a photonic cell of a base node"

mean, and it is not clear how to routing an "optical path". An optical signal can be routed to go through different "path", but an "optical path" cannot be routed.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-2, 4, 10-11, 13, 15, and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Smith (U.S. Patent Application Publication US 2002/0196490 A1).

Regarding claims 1 and 10, as they are understood in view of the above 112 problems, Smith teaches an optical network comprising: one photonic cell (fig. 1) comprising: the photonic cell comprising a base node (fig. 1, 11 in the state of IN) and a plurality of member nodes, for example, the nodes located in states of IL, IA, AL, WV, MI, and OH in fig. 1, each member node is within optical reach from the base node (paragraph 0031); optical paths (the links between nodes); the optical paths being established based on information of the photonic cells.

Regarding claims 2 and 11, Smith further teaches the optical reach is predetermined in a link engineering process (paragraphs 0031-0040).

Regarding claims 4 and 13, Smith further teaches that optical path is selected based on a number of optical to electrical conversions (paragraph 0033).

Regarding claim 15, Smith further teaches selecting said route through an electrical cross-connect of a second node in said network, the second node having both electrical cross-connect and photonic cross-connect (paragraph 0032-0033).

Regarding claim 18, Smith further teaches that the information of the photonic cells are stored in an centralized database (paragraphs 0081 and 0131).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 5-7, 14, 16-27, 19, and 20-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith (U.S. Patent Application Publication US 2002/0196490 A1).

Regarding claims 5 and 14, Smith differs from the claimed invention in that Smith does not specifically teach that the number of optical to electrical conversion is minimal. However, Smith further teaches to route optical signals that do not need to be regenerated to continue propagate without going through a regenerator (paragraph 0032). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to minimize the number of the optical to electrical

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conversions in order to reduce the cost and increase reliability of information communications.

Regarding claims 6-7, Smith differs from the claimed invention in that Smith does not specifically teach that the information of the photonic cells is distributed in a routing protocol. However, Smith further teaches transmit information through the photonic cells (paragraph 0038). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to distribute the information of the photonic cells in a routing protocol in order to configure the system to regenerate optical signals needed and bypass optical signals do not need to be regenerated.

Regarding claim 16-17, as they are understood in view of the above 112 problems, Smith differs from the claimed invention in that Smith does not specifically teach forming a membership list of photonic cells based on the optical route. However, Smith further teaches to route data in the photonic cells (paragraph 0031-0039). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to form an information list of photonic cells based on the optical route in order to route an optical signal efficiently in the photonic cells.

Regarding claim 19, Smith differs from the claimed invention in that Smith does not specifically teach that the information of the photonic cells is distributed in a routing protocol. However, Smith further teaches transmit information through the photonic cells (paragraph 0038). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to distribute the information of the

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photonic cells in a routing protocol in order to configure the system to regenerate optical signals needed and bypass optical signals do not need to be regenerated.

Regarding claims 20-29, Smith has been discussed above in regard to claims 10-19. Smith differs from the claimed invention in that Smith does not specifically teach a computer readable medium storing instructions for use in the execution in a computer of a method for determining an optical path through a network. However, Smith further discloses several flow charts of various methods of combining spectral groups (figs. 25a-d). These flow charts are obviously carried out by computer system and it inherently employs a computer readable medium storing instructions for use in the execution in a computer. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a computer readable medium storing instructions for use in the execution in a computer in order to efficiently determine the optical route for an optical signal in the network having a plurality of photonic cells.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Acampora et al. (U.S. Patent US 5,530,575) disclose a systems and methods for employing a recursive mesh network for applications in local, wide area, and national fiber optic telecommunications.

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13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571) 272-3114. The examiner can normally be reached on 9:00 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qzw
10/23/2005


M. R. SEDIGHIAN
PRIMARY EXAMINER